Hundreds Boards

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

46 - 28

Dan: "This is 28, so I went down one, 38, then another one 48, then back 2, 46. So 46 – 28 is 18.

Suzy: "I thought if it was down 10 and then 1,2,3,4, 5,6,7,8 and 10 + 8 is 18."

Hal: "28 and 20 is 48 so 2 less is 46: 20 minus 2 is 18."

Our numeration system is based on ten and powers of ten such as a hundred, thousand and ten thousand. Coming to know "hundred" in a meaningful way is actually quite complex. We say students have constructed a hundred as a mathematical object when they can think of it simultaneously as one thing (hundred), hundred things, or ten tens. Coordinating ones, tens and hundreds is an important accomplishment in coming to know number. One hundred can become a unit with which to think along with five and ten; they become mental landmarks.

Coming to know the numbers from one to one hundred involves making, in a mental sense, the landmarks of 10, 20, 30, 40, 50, 60, 70, 80, and 90. To a second grader, 37 may have little meaning other than a word said in counting. Or it may be thought of as a collection of 37 single objects. When it becomes related to 27 and 47, the student has made significant progress in coming to know 37. Some students may think of 37 as having a ten part and ones part but still not have a sense of 37 as a number of objects. For example, when asked to count out 16 objects and write the numeral for that number and then asked to "Show what this means (pointing to the 1 of 16)" students will often indicate a single object in the set. These students may be able to say that 37 is three tens and seven and yet not have constructed it as a number in a deeper sense, the three tens and seven ones may not be coordinated. Until students can coordinate tens and ones their reasoning will be limited. When asked "What is ten more than 27?" these same students will count by ones, indicating that, for them, 37 is unrelated to 17, 27, and 47.

The hundreds board can help students learn to coordinate tens and ones so that two-digit numerals have mathematical meaning related to other numbers. Working on a hundreds board to add and subtract two-digit numbers provides opportunities for students to construct many number patterns which can be useful in using numbers in meaningful settings. Because 7, 17, 27, 37, . . . are aligned under each other in a column. The opportunity exists for students to relate them as "ten more." When adding 26 and 17 on a hundreds board, students may at first count-on from the 26 seventeen times and take the number under their finger at that point as the answer. In the process of doing so,

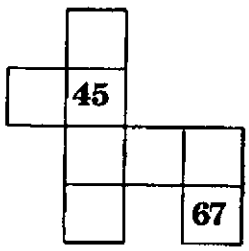
they have the opportunity to realize that by moving down one space they are adding ten so they might say 26, 36, 37, 38, 39, 40, 41, 42, 43, . . . 43. While still an inefficient way of adding 26 and 17, the activity can help students think of two-digit numerals as names for numbers that are in a sequence from one to one hundred, intimately related to each other.

Students can come to use a numbered hundreds board in a mechanical way and not construct more abstract ways of reasoning. Using a blank hundreds frame can help students move beyond a procedural counting-on strategy to constructing abstract number patterns and relationships. You may also want to have a hundreds chart in the classroom.

When hundreds boards are available for students to use in their number activity, the following procedures have been found to help them construct meaning of numbers and think in tens.

→ Give each student a blank hundreds board with just the numbers 1 and 2 in position. Have students write the numbers on their hundreds boards. Encourage them to find patterns as they fill in all spaces on thier hundreds board. Conclude with a whole class discussion of the various patterns students noticed as they were completing the hundreds board.

Make an overhead transparency of a blank hundreds board. Place a penny on one of the squares of the board and ask students to figure out the number that should be written there. Have students share the different ways they used to decide the number that should be in that place on the board. This activity can be used as a class opener one or two days each week.



Duplicate the following activity sheets and have students work in pairs to complete them in preparation for class discussion. The class discussion is an integral part of the lesson. Have students describe the ways they reasoned in filling in empty squares.

Thousands Books. When you feel students are getting comfortable thinking in tens, have them make a thousands book. Distribute 10 blank hundreds grids to each student and have them write the numbers from one to 100 on the first, 101 to

200 on the next and so on. This may take several class periods to be completed. You may wish the students to complete this activity at home. Once completed, have each student design a cover and make their Thousands Book. These can be kept on the shelf for reference when working with three digit numbers. This activity helps students give meaning the numbers such as 538. They can form a mental image from their thousands book experience and think of 538 as being on the fifth sheet down and in the 38 position. Many students go through elementary school without giving meaning to numbers in the hundreds. They may become proficient with procedures for adding and subtracting such symbols but not have any mathematical idea what they are doing. Just as students need opportunities to construct meaning for the numbers from one to ten and then to a hundred, they also need opportunities to construct meaning for the numbers in the hundreds.

Hundreds Board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
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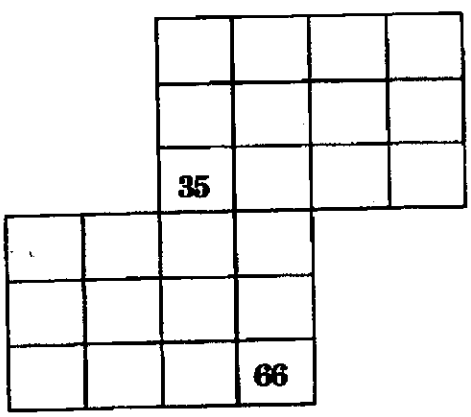
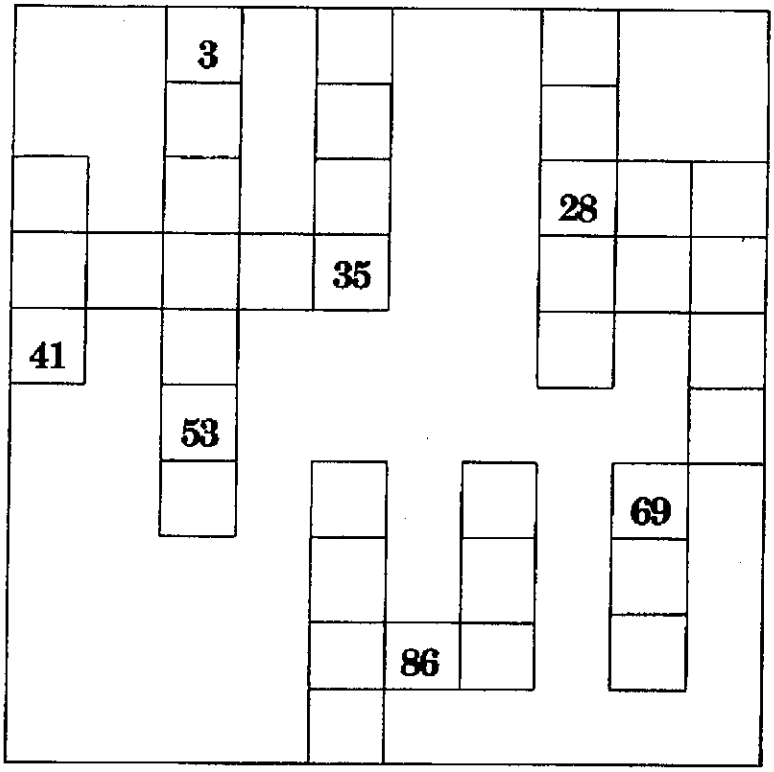
	42	43	44	45		47	48	49	50
51		53	54	55	56	57		59	60
61	62		64		66	67	68		
	72		74	75	76		78	79	80
81	82		84		86	87		89	90
91		93		95	96	97	98	99	100

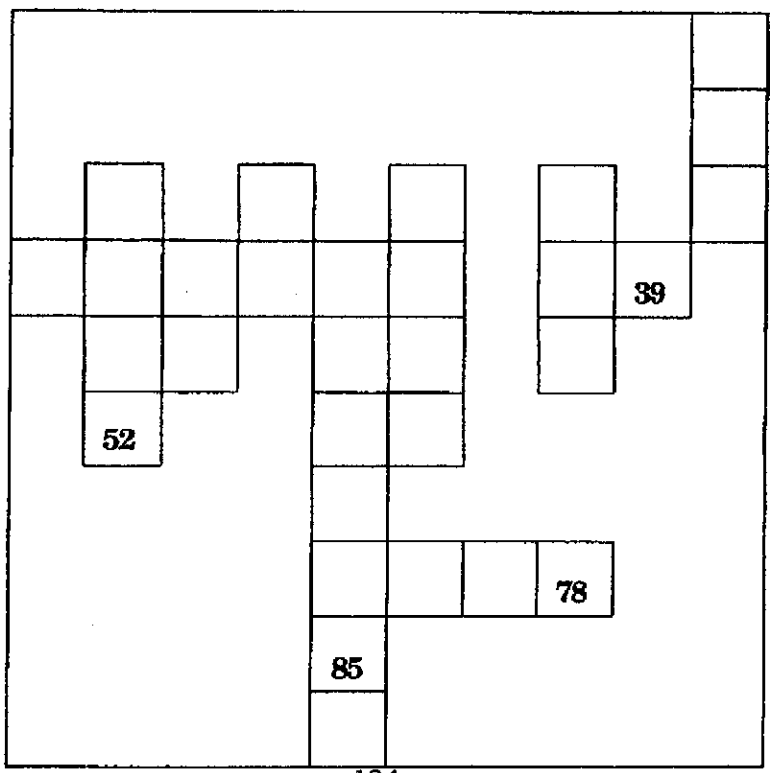
Hundreds Boards

31	32	33	34	35	36	37	38	39	40
					46				
							78		



Hundreds Boards





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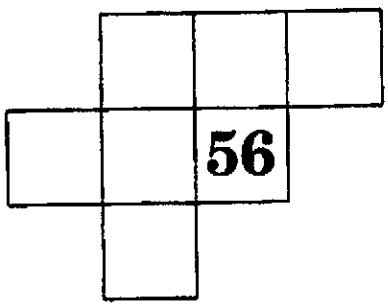

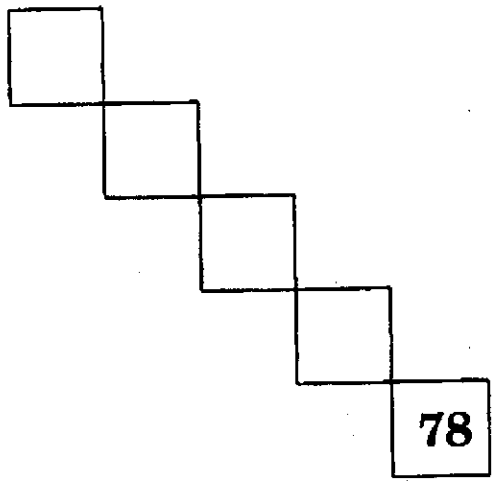

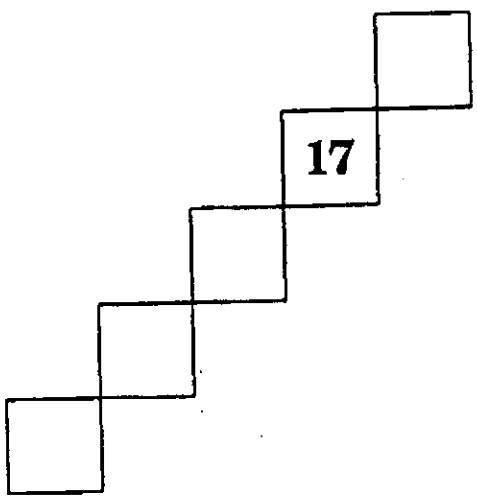

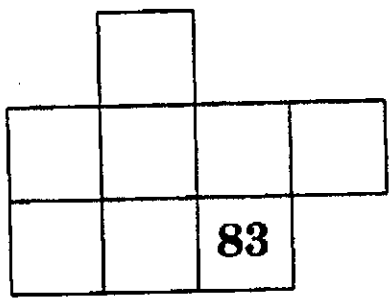

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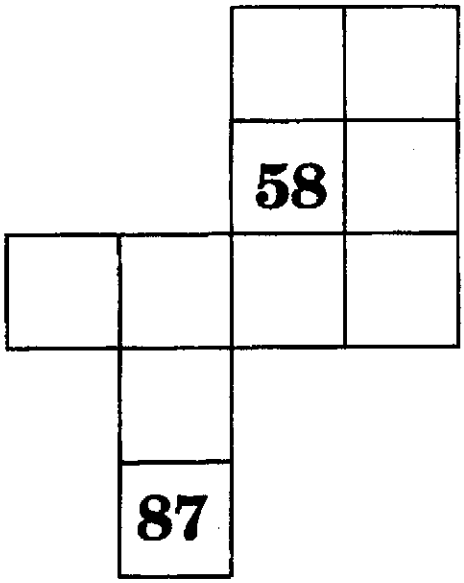

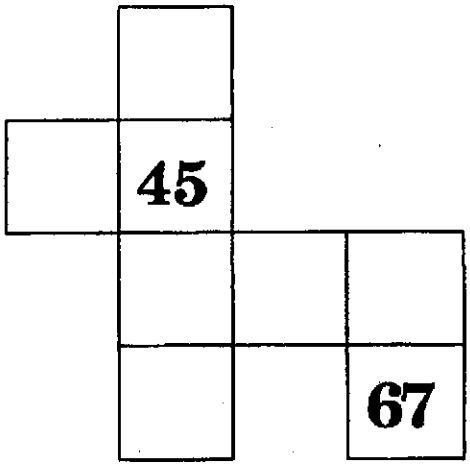

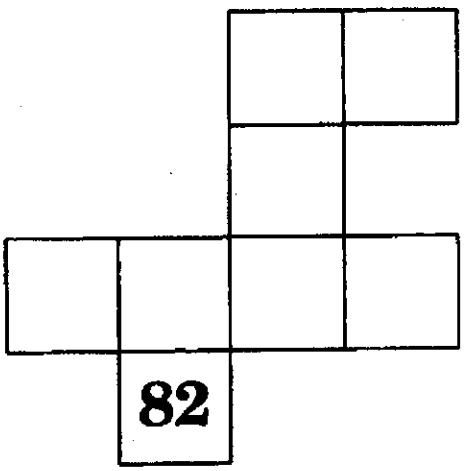

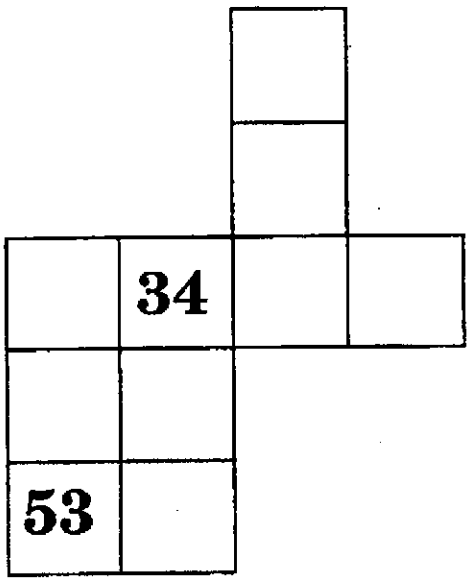

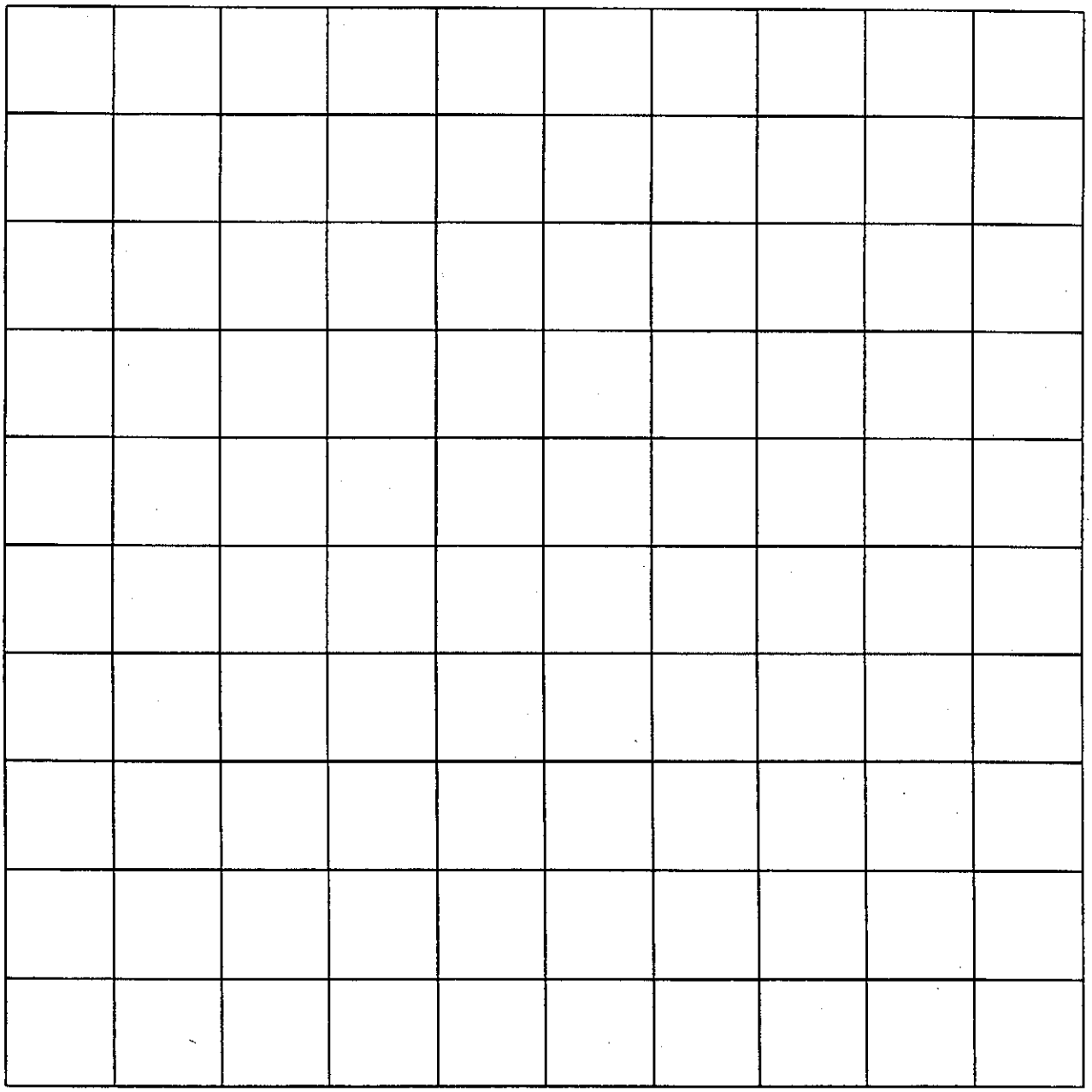

Thousands Book master page to be duplicated, 10 for each student.

Hundreds Board

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